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M32C PC4701 Emulator Debugger V.1.03.00
Release Notes

This document describes the notes of this debugger, and please read before you start to use this debugger.

And also, please refer to the "High-performance Embedded Workshop Release Notes" about the notes of High-performance Embedded Workshop IDE.

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1 Notes

1.1 Line Assembly

Regardless of the Radix setting, the default for line assembly input is decimal. Specify H as the radix for a hexadecimal input.

1.2 Event Setting

1. TAB order in Set Event Status dialog box
   Even when you press [TAB] key, the next input control may not be focused on the Set Event Status dialog boxes opened from H/W Break, Time Measurement, and Trace Point.
2. In-place-edit mode on event list
   On event list in H/W Break, Time measurement and Trace Point, High-performance Embedded Workshop will not escape from in-place-edit mode even when you press the [ESC] key.
3. Event setting by BIT SYMBOL
   When the specified address is odd numbers, the setting by BIT SYMBOL can not set the correct condition. Use DATA ACCESS setting and specify the compared data with the data mask. For details about how to set the conditions for odd number addresses, refer to the online help.
4. Event detection for BIT SYMBOL
   When the event is set to detect the access to specified bit, it will be detected even if the other bit of the same address as the specified bit is accessed. This is because the access to the bit from MCU is byte access.

1.3 Data Trace

1. Split-bar behavior when double-clicking
   If you double-click the split-bar, which divides view up and down, the horizontal scroll-bar, vertical scroll-bar, and tabs in the upper view will vanish. Drag the split-bar to display them again.

1.4 Trace

1. Specifying function in SRC mode
   In the SRC mode, when you specify a function to display it, if the current displayed source file includes the function, the top of the source file will be displayed.
2. Saving of tracing result in text
   When you save a tracing result in text with only “BUS” and “DATA” buttons ON, the vertical position of some headers will shifts from the corresponding data. Check “Tab Separated Format” and open it with spreadsheet applications to display them correctly.
3. Loading the trace image file
   Trace window can not load the trace image file saved by PDxx debuggers. And also, trace window can not load the trace image file saved by the different target from the current target.

1.5 RAM Monitor

1. Proportional Fonts
   When a proportional font is selected, a part of the characters in the view may be hidden. Fixed fonts are recommended.

1.6 Memory

1. 8 bytes data operations
   To set, fill, and copy 8 bytes data are not supported.

1.7 Script

1. Result of interactive command
   When you invoke an interactive command, for example, Assemble and setMemoryByte, the running dialog box will appear and may hide the view of the results.
2. SCOPE Command
   When you refer current scope name with SCOPE command after program execution, the scope

of the start-up module will be returned even if scope has been changed to the other.

1.8 Real-time OS debugging functions

1. When several labels are allocated to the entry address of the tasks or handlers, the task name or the handler name displayed in the windows may be different from the actual function name.

2. When you use the feature to issue system-calls by the script command (MR SYS), the target program should be built with a specific option. For details, refer to the topic “Prepare the real-time OS debug” in the online help.

3. When you use the task pause function, the following code should be inserted to the configuration file of your target program. For details, refer to the user’s manual of the real-time OS.

```
// System Definition
system {
      :
    task_pause = yes; // Insert this line
};
```

4. The task pause function uses the address match interrupt of the target MCU. When the target program uses the address match interrupt, the task pause function can not be used.

5. The script command “MR STK, BASE” assigns one coverage area so that the area includes the top address of the system stack area. When you need to check the coverage of other areas, don’t use the “MR STK, BASE” command and use the “CoVerage BASE” command to assign coverage area instead. The system stack area and each task stack area will be displayed by the script command “MR STK, SYS” and “MR STK, TASK”.

1.9 Macro recording function

The debug windows which support the macro recording function are memory, registers, IO, ASM watch, and C watch. And also, the debug operations which support this are Reset CPU, Go, Reset Go, Go To Cursor, Step In, Step Over, Step Out, Add/Delete break points, and Download the target program.

1.10 Test facility function

The contents to be compared by the test facility functions are memory, registers, I/O, Output, stack race, ASM watch, and C watch.

1.11 Using cast operators for the member variable

When you use cast operators for the member variable to refer to it as the pointer of the structure, you would not refer to it correctly.

1.12 Download module dialog box

This debugger does not support the setting of "Offset", "Memory verify on download", and "Access Size" in the download module setting dialog box. These are always treated as "Offset: 0", "Memory verify: off", and "Access Size: 1".

1.13 Real-time execution of the target program

If the following operations are invoked while the target program is running, the real-time execution capability will be lost.

- Dump memory
  - update the display of Memory Window
  - update the display of ASM Watch Window or C Watch Window
  - update the display of Source Window (DIS or MIX mode)
  - display the value of variables in Source Window
- Clear access history in RAM Monitor Window

- Change the ram monitor area in RAM Monitor Window
- Add or remove software break points
- Change the status of hardware break points
- Get the trace information forcibly or re-start recording the trace information in Trace Window

1.14 The option “Always treat variables of enumerator type with unknown size as 1 byte”

The “Always treat variables of enumerator type with unknown size as 1 byte” option is effective after downloading the program. When the option status is changed, target program should be downloaded again.

And also, this option is effective for all variables of enumerator type in the program, even if the compiling options are different for each file.

1.15 Debugging for assembler macros

When the break points are set at the assembler macro codes, the break points would be set at the different address or not be displayed as the PC line.

1.16 Debugging for inline functions

When stepping the function including the call for a inline function, local variables would not be able to be referred.

1.17 Automatic target connection on changing the session

When the target connection is not performed on changing the session, select the menu [Debug] -> [Connect]. To perform automatic target connection, remove the check from the option “Do not perform automatic target connection” in the Option tab on Debug Setting dialog box which is invoked by the menu [Debug] -> [Debug Settings…].

1.18 Run program option

The “Run Program” dialog box enables to specify several temporary PC breakpoints, but this debugger only supports one breakpoint which is listed first in the “Temporary PC breakpoints” list box.

1.19 Selection of the object format for download module

When the specified file format in the debug setting dialog box is different from the format of the object module file, downloading the file may cause a freeze of the debugger. Please select the correct object format. And also, when selecting the object format for download module file, if there are two or more object format, whose name includes the vender name another ones do not include it, prioritize the file whose name includes vender name leading the object format name.

1.20 Notes on Debugging (M32C PC4701 Emulator Debugger)

1.20.1 In the case of using PC4701M with IAR’s cross tools

When you have all the following conditions at once, the IAR’s cross tools may not work correctly.

- Using the PC4701M in ECP mode of LPT connection
- The M16C PC4701 emulator software running

1.20.2 About the self-check function

In using the self-check function, if you connect the PC4701 emulator with PC via LAN interface, the self-check may fail to diagnose the emulator. When you use the self-check function, please use another communication interface except LAN interface.

1.20.3 About LAN communication with emulators by Windows XP or Windows2000

It is necessary for LAN communication with emulators by Windows XP or Windows 2000 to set the following registry.

1. When using Windows XP or Windows 2000

Key	Value
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\ Parameters\SackOpts	0 (REG_DWORD)

You can set this registry by executing the registry setup program, "Sack.exe". And you can clear the registry with running the program "UnSack.exe".

- Sack.exe", the program setting the registry.
- Unsack.exe", the program clearing the registry.

The above programs are installed under the directory "\Utility" in the directory where the emulator software is installed.

(Ex. C:\ Renesas\HEW\Tools\Renesas\DebugComp\Platform\PDTarget)

When using Windows XP/2000, make sure Sack.exe and UnSack.exe are executed by a user who has Administrator rights. Users without Administrator rights cannot set the registry.

Supplementary:

Windows XP/2000 TCP supports "Selective Acknowledgments (SACK)" as documented in RFC 2018. SACK gives higher performance in the network which have high bandwidth and long round-trip delays like satellite channels. SACK support is enabled by default in Windows XP/2000. It is necessary for LAN communication with emulators by Windows XP/2000 to disable SACK support. Setting the above registry can disable SACK support.

Note that when you use the network which have high bandwidth and long round-trip delays like satellite channels, the performance with SACK support disabled is lower than with enabled.

1.20.4 Disassembly display in Trace window

The disassembled instructions may not be displayed correctly in the case blow:

- The operand fetch results are not stored in the trace memory because of the lack of the trace memory.
- Address match interrupt occurred just after the opecode fetch.

1.20.5 The option “Attempt to access memory even in WAIT/STOP mode”

The option “Attempt to access memory even in WAIT/STOP mode” has been added since the emulator debugger V.1.03. If the option is OFF, the debugger checks whether the status of the connected MCU is HALT. And if the MCU is in HALT status, debugger does not access memory. This behavior will improve the freeze for several seconds because of the memory access to the MCU in HALT status. Instead, it will cause a little overhead to check the status in each memory accesses. Set the check to this option, if the operations slow because of the overhead.

2 System Requirements

2.1 M32C PC4701 Emulator Debugger

Target host PC	
PC	IBM PC/AT compatible with Pentium III 600MHz or higher
OS	Windows XP Windows 2000
Memory	128MB or more (and in addition, ten or more times as much size as the load module file).
HDD	Hard disk available capacity for installation: 100MB or more. Prepare an area at least double the memory capacity (four-times or more recommended) as the swap area.
Display Resolution	1024 x 768 or higher recommended

Emulator			
PC4701U	PC4701M	PC4701HS	PC4700H

Emulation Pod for M32C/80 Series	MCU file
M30830T-RPD-E	M30835.MCU

Emulation Pod for M16C/80 Series	MCU file
M30803T-RPD-E	M30803.MCU
M30800T-RPD-E	M30800.MCU

3 Version Report

This section describes the specification of the changed software.

3.1 M32C PC4701 Emulator Debugger V.1.03.00

In this version, the following specifications were changed from the previous version M32C PC4701 Emulator Debugger V.1.02.00.

This version supports all of the function extensions and the revisions to the restrictions in the High-performance Embedded Workshop V.4.02.00 and V.4.03.00. For more details, please refer to the RENESAS TOOL NEWS "061216/tn2" issued on December 16, 2006 and "070701/tn1" issued on September 1st, 2007.

3.1.1 Revisions to Restrictions

1. A limitation has been corrected: The registers can not be referenced correctly in the IO window. (For more details, refer to the RENESAS TOOL NEWS "061216/tn7" issued on December 16, 2006)
2. A limitation has been corrected: if the On Demand check box is checked in the Debugging Information tab of the Init dialog box, which appears when you invoke your debugger, target programs may not be loaded successfully on MCUs and not run properly. (For more details, refer to the RENESAS TOOL NEWS "070416/tn8" issued on April 16, 2007).
3. A limitation has been corrected: If the size of the variable to be referred by the quick watch feature is larger than 256 bytes, High-performance Embedded Workshop would crash. (For more details, refer to the RENESAS TOOL NEWS "070601/tn5" issued on June 1st, 2007).

3.1.2 Functional Extensions and Modifications

1. Displaying source files information automatically in the Workspace Window. When a download module file is downloaded, the High-performance Embedded Workshop obtains source files information contained in the download module file through its debug information, and displays it under "download module" node in the Projects tab on the Workspace Window. Note that this function is available only for debugging the debug-only projects.
2. Supports C watch window included in High-performance Embedded Workshop V.4.03. The feature Changing scope of the variable and suppression leading zero are supported.
3. The option to specify the size (1byte or 2byte) of enumerator type is added.
4. Supports "Disconnect target" feature.
5. When the instruction is modified by the line assemble feature, if the old instruction length is longer than the new instruction length, NOP instructions are inserted automatically so as to suit the old instruction length.
6. The instruction format specifier is displayed for each instruction in disassembly. And also, can be switched not to display.
7. Supports to substitute the bit field member variable.
8. The default value of "Reset CPU after download module" is changed to be checked.
9. The option not to access memory while CPU is wait/stop mode is added.

3.2 M32C PC4701 Emulator Debugger V.1.02.00

In this version, the following specifications were changed from the previous version M32C PC4701 Emulator Debugger V.1.00.00.

This version supports all of the function extensions and the revisions to the restrictions in the High-performance Embedded Workshop V.4.01.00 and V.4.01.01. For more details, please refer to RENESAS TOOL NEWS "060701/tn1" issued on July 1, 2006 and "060801/tn1" issued on August 1, 2006.

3.2.1 Revisions to Restrictions

1. A limitation has been corrected: The structure member variables, union member variables, or class member variables whose name begins with a letter of 'e' or 'E' immediately followed by a numeral, are not referenced.

For more details, refer to the RENESAS TOOL NEWS RSO-M3T-PD32RM-060116D issued on January 16, 2006.

2. A limitation has been corrected: If the Task Pause button is pressed while a service call is being serviced, the target task of the service call does not enter the pause state but goes to the object-waiting state though it is displayed in the debugger screen that the task has entered the pause state.
   For more details, refer to the RENESAS TOOL NEWS RSO-M3T-MR308-060416D issued on April 16, 2006.

3.2.2 Functional Extensions and Modifications

3. These commands, which can be invoked in Command Line, have been supported:
   breakpoint, breakpoint_disable, breakpoint_display, breakpoint_clear
   register_display, register_set
   disassemble, assemble